



Full wwPDB X-ray Structure Validation Report ⓘ

Feb 14, 2024 – 09:10 AM EST

PDB ID : 3LNN
Title : Crystal structure of ZneB from Cupriavidus metallidurans
Authors : Lee, J.K.; De Angelis, F.; Miercke, L.J.; Stroud, R.M.; Vandenbussche, G.;
Center for Structures of Membrane Proteins (CSMP)
Deposited on : 2010-02-02
Resolution : 2.80 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Xtriage (Phenix) : 1.13
EDS : 2.36
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.36

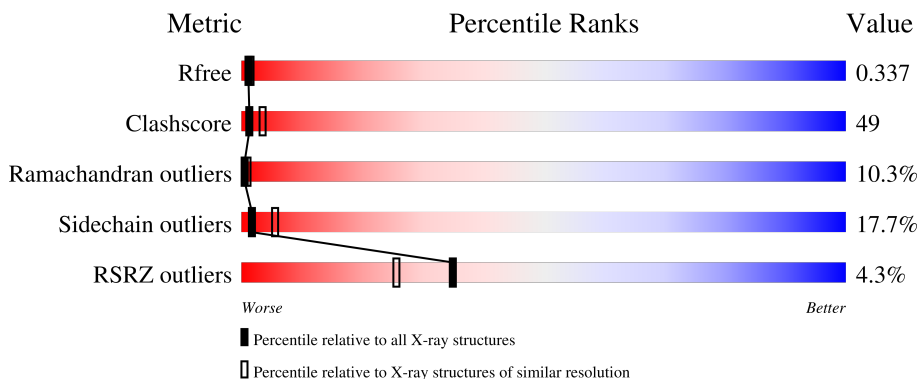
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.80 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	3140 (2.80-2.80)
Clashscore	141614	3569 (2.80-2.80)
Ramachandran outliers	138981	3498 (2.80-2.80)
Sidechain outliers	138945	3500 (2.80-2.80)
RSRZ outliers	127900	3078 (2.80-2.80)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	359	
1	B	359	

2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 4361 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called Membrane fusion protein (MFP) heavy metal cation efflux ZneB (CzcB-like).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	341	2537	1581	461	487	8	0	0	0
1	B	245	1807	1120	323	358	6	0	0	0

There are 20 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	1	MET	-	expression tag	UNP Q1LCD7
A	351	PRO	-	expression tag	UNP Q1LCD7
A	352	ASP	-	expression tag	UNP Q1LCD7
A	353	LEU	-	expression tag	UNP Q1LCD7
A	354	LEU	-	expression tag	UNP Q1LCD7
A	355	GLU	-	expression tag	UNP Q1LCD7
A	356	VAL	-	expression tag	UNP Q1LCD7
A	357	LEU	-	expression tag	UNP Q1LCD7
A	358	PHE	-	expression tag	UNP Q1LCD7
A	359	GLN	-	expression tag	UNP Q1LCD7
B	1	MET	-	expression tag	UNP Q1LCD7
B	351	PRO	-	expression tag	UNP Q1LCD7
B	352	ASP	-	expression tag	UNP Q1LCD7
B	353	LEU	-	expression tag	UNP Q1LCD7
B	354	LEU	-	expression tag	UNP Q1LCD7
B	355	GLU	-	expression tag	UNP Q1LCD7
B	356	VAL	-	expression tag	UNP Q1LCD7
B	357	LEU	-	expression tag	UNP Q1LCD7
B	358	PHE	-	expression tag	UNP Q1LCD7
B	359	GLN	-	expression tag	UNP Q1LCD7

- Molecule 2 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	1	Total 1	Zn 1	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
3	A	5	Total 5	O 5	0	0
3	B	11	Total 11	O 11	0	0

VAL VAL
VAL PRO
MET MET
SER LEU
ALA ILE
VAL VAL
GLN SER
SER GLY
PHE TYR
THR THR
ARG ARG
ALA PHE
VAL VAL
GLU VAL
VAL VAL
ALA ALA
PRO TRP
TRP TRP
GLN PHE
PHE GLU
PRO PRO
ARG ARG
VAL VAL
ILE ILE
LYS LYS
LEU LEU
GLY GLY
ALA ALA
GLN GLN
ILE ILE
GLY GLY
ASP ASP
ARG ARG
MET MET
VAL VAL
LYS LYS
SER SER
GLY GLY
LEU LEU
SER SER
ALA ALA
GLY GLY
ASP ASP
ARG ARG
VAL VAL
VAL VAL
VAL VAL
LYS LYS
GLU GLU
GLY GLY
VAL VAL
LEU LEU

ASN
ASP
PRO
ASP
LEU
LEU
GLU
VAL
LEU
PHE
GLN

4 Data and refinement statistics i

Property	Value	Source
Space group	I 41 2 2	Depositor
Cell constants a, b, c, α , β , γ	137.11Å 137.11Å 202.90Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	32.96 – 2.80 37.38 – 2.80	Depositor EDS
% Data completeness (in resolution range)	85.1 (32.96-2.80) 95.9 (37.38-2.80)	Depositor EDS
R_{merge}	0.10	Depositor
R_{sym}	0.07	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.34 (at 2.81Å)	Xtrriage
Refinement program	PHENIX (phenix.refine: 1.5_2)	Depositor
R, R_{free}	0.237 , 0.314 0.251 , 0.337	Depositor DCC
R_{free} test set	1188 reflections (5.11%)	wwPDB-VP
Wilson B-factor (Å ²)	78.6	Xtrriage
Anisotropy	0.166	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.29 , 59.2	EDS
L-test for twinning ²	$\langle L \rangle = 0.51$, $\langle L^2 \rangle = 0.35$	Xtrriage
Estimated twinning fraction	0.018 for $-1/2^*h-1/2^*k-1/2^*l, -1/2^*h-1/2^*k+1/2^*l, -h+k$ 0.001 for $-1/2^*h+1/2^*k-1/2^*l, 1/2^*h-1/2^*k-1/2^*l, -h-k$	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	4361	wwPDB-VP
Average B, all atoms (Å ²)	90.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.72% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section:
ZN

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.52	0/2579	0.83	2/3506 (0.1%)
1	B	0.47	0/1834	0.71	1/2493 (0.0%)
All	All	0.50	0/4413	0.79	3/5999 (0.1%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed($^{\circ}$)	Ideal($^{\circ}$)
1	A	56	LYS	N-CA-C	7.18	130.38	111.00
1	B	56	LYS	N-CA-C	-6.99	92.14	111.00
1	A	278	ALA	C-N-CA	5.47	135.38	121.70

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	55	ALA	Peptide

5.2 Too-close contacts

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	2537	0	2501	240	0
1	B	1807	0	1754	190	0
2	A	1	0	0	0	0
3	A	5	0	0	0	0
3	B	11	0	0	1	0
All	All	4361	0	4255	424	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 49.

All (424) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:308:VAL:HB	1:A:309:ALA:HB3	1.27	1.11
1:B:93:LEU:HD12	1:B:94:ALA:N	1.66	1.11
1:B:214:ALA:HB1	1:B:215:GLN:HB2	1.25	1.11
1:A:226:GLN:HA	1:A:227:SER:HB2	1.34	1.09
1:A:319:LYS:HA	1:A:320:LEU:HB2	1.26	1.09
1:A:55:ALA:HA	1:A:57:LEU:H	1.13	1.07
1:B:93:LEU:HD12	1:B:94:ALA:H	1.12	1.06
1:A:323:GLN:O	1:A:324:ILE:HG13	1.54	1.05
1:A:245:TYR:HA	1:A:246:VAL:HG23	1.38	1.04
1:B:219:LEU:HD21	1:B:257:THR:HG21	1.39	1.04
1:B:117:GLN:OE1	1:B:131:PHE:HA	1.56	1.04
1:A:292:MET:HE1	1:A:328:MET:HG2	1.42	1.02
1:B:93:LEU:CD1	1:B:169:HIS:HA	1.88	1.02
1:A:104:ARG:HG3	1:A:104:ARG:HH11	1.22	1.02
1:B:183:ASP:HB2	1:B:201:THR:HB	1.42	1.02
1:B:93:LEU:HD13	1:B:169:HIS:CA	1.92	1.00
1:A:246:VAL:HG12	1:A:247:GLY:N	1.77	0.99
1:A:292:MET:CE	1:A:328:MET:HG2	1.93	0.97
1:A:103:ALA:HB1	1:A:145:SER:HA	1.46	0.97
1:A:217:LYS:HE3	1:A:322:ALA:HA	1.47	0.96
1:A:343:LYS:CB	1:A:344:GLU:HA	1.96	0.95
1:A:194:ASP:HB3	1:A:197:ALA:HB2	1.45	0.94

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:282:SER:HB3	1:B:283:GLN:HA	1.44	0.94
1:A:316:ARG:HG3	1:A:316:ARG:HH11	1.30	0.94
1:A:195:THR:HA	1:A:196:THR:C	1.84	0.94
1:B:93:LEU:HD13	1:B:169:HIS:HA	0.97	0.94
1:B:142:ALA:O	1:B:146:GLN:HG3	1.69	0.93
1:B:174:ARG:O	1:B:175:SER:HB3	1.67	0.92
1:A:301:TYR:HA	1:A:302:THR:HG22	1.52	0.91
1:A:323:GLN:HB3	1:A:328:MET:HE2	1.53	0.91
1:A:344:GLU:HG2	1:A:345:GLY:H	1.34	0.90
1:B:282:SER:CB	1:B:283:GLN:HA	2.01	0.90
1:B:85:LEU:HD11	1:B:175:SER:HB2	1.53	0.88
1:A:226:GLN:CA	1:A:227:SER:HB2	2.04	0.88
1:B:214:ALA:HB1	1:B:215:GLN:CB	2.04	0.88
1:A:316:ARG:HH11	1:A:316:ARG:CG	1.86	0.87
1:B:199:LEU:HD23	1:B:199:LEU:H	1.40	0.86
1:B:267:ASP:OD1	1:B:269:ARG:HG3	1.74	0.86
1:A:278:ALA:HA	1:A:279:THR:OG1	1.74	0.86
1:B:223:TYR:CZ	1:B:226:GLN:HB3	2.10	0.86
1:B:265:ASN:N	1:B:266:PRO:HD2	1.91	0.85
1:A:55:ALA:HA	1:A:57:LEU:N	1.91	0.83
1:A:246:VAL:HG12	1:A:247:GLY:H	1.40	0.83
1:A:195:THR:HA	1:A:196:THR:O	1.79	0.82
1:B:265:ASN:H	1:B:266:PRO:CD	1.92	0.82
1:A:21:PRO:HA	1:A:22:ALA:HB3	1.62	0.82
1:A:308:VAL:HG23	1:A:312:GLN:O	1.80	0.82
1:B:215:GLN:HB3	1:B:218:ASP:OD2	1.79	0.82
1:A:320:LEU:H	1:A:331:LYS:HG2	1.44	0.81
1:B:219:LEU:CD2	1:B:257:THR:HG21	2.11	0.81
1:B:265:ASN:H	1:B:266:PRO:HD2	1.46	0.80
1:A:319:LYS:CA	1:A:320:LEU:HB2	2.11	0.79
1:A:85:LEU:HD11	1:A:175:SER:HB2	1.65	0.79
1:B:234:ALA:O	1:B:235:TYR:HB2	1.82	0.78
1:A:245:TYR:HA	1:A:246:VAL:CG2	2.12	0.78
1:B:124:GLU:HG3	1:B:125:ILE:HG23	1.66	0.77
1:A:296:VAL:HG21	1:A:347:LEU:HD23	1.64	0.77
1:B:160:GLY:HA2	1:B:171:LEU:HD21	1.66	0.76
1:A:37:ARG:HG2	1:A:286:GLU:HG3	1.67	0.76
1:B:98:SER:O	1:B:102:LYS:HG2	1.85	0.76
1:B:214:ALA:CB	1:B:215:GLN:HB2	2.12	0.75
1:A:297:GLN:HA	1:A:302:THR:H	1.50	0.74
1:A:324:ILE:HD12	1:A:324:ILE:O	1.85	0.74

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:288:ILE:HD12	1:A:289:VAL:N	2.02	0.74
1:A:300:PHE:O	1:A:301:TYR:CG	2.41	0.74
1:A:300:PHE:O	1:A:301:TYR:CD1	2.41	0.73
1:A:319:LYS:HA	1:A:320:LEU:CB	2.14	0.73
1:A:342:VAL:N	1:A:343:LYS:HA	2.02	0.73
1:B:165:ALA:HB1	1:B:166:GLY:HA2	1.70	0.73
1:B:244:ARG:HH11	1:B:244:ARG:HB3	1.51	0.73
1:A:21:PRO:HA	1:A:22:ALA:CB	2.17	0.73
1:A:234:ALA:HB2	1:B:217:LYS:HA	1.70	0.72
1:A:197:ALA:O	1:A:198:SER:HB3	1.89	0.72
1:B:122:LYS:HA	1:B:124:GLU:N	2.04	0.72
1:A:76:GLY:O	1:A:180:ARG:NH1	2.23	0.72
1:A:18:LEU:HD13	1:A:346:VAL:HG22	1.73	0.71
1:B:282:SER:HB3	1:B:283:GLN:CA	2.19	0.71
1:A:116:ARG:O	1:A:117:GLN:HG3	1.91	0.71
1:B:53:ASP:O	1:B:56:LYS:HB2	1.91	0.71
1:A:246:VAL:CG1	1:A:247:GLY:N	2.48	0.70
1:B:199:LEU:HD23	1:B:199:LEU:N	2.06	0.70
1:B:221:HIS:CD2	1:B:283:GLN:H	2.09	0.70
1:B:214:ALA:N	1:B:256:THR:HB	2.06	0.70
1:B:117:GLN:HG2	1:B:131:PHE:HD2	1.56	0.70
1:B:222:VAL:HA	1:B:226:GLN:HE22	1.57	0.69
1:B:265:ASN:N	1:B:266:PRO:CD	2.53	0.69
1:A:21:PRO:CA	1:A:22:ALA:HB3	2.22	0.69
1:B:79:VAL:HA	1:B:80:LYS:CB	2.22	0.69
1:B:221:HIS:HD2	1:B:283:GLN:H	1.40	0.69
1:A:245:TYR:CG	1:A:246:VAL:HB	2.26	0.69
1:A:91:ALA:N	1:A:92:ASP:HB2	2.08	0.69
1:B:90:SER:HB3	1:B:93:LEU:HG	1.75	0.69
1:B:213:ASN:O	1:B:214:ALA:HB3	1.93	0.69
1:A:316:ARG:HG3	1:A:316:ARG:NH1	2.05	0.68
1:A:301:TYR:HA	1:A:302:THR:CG2	2.24	0.68
1:B:219:LEU:HD21	1:B:257:THR:CG2	2.21	0.67
1:A:104:ARG:HH11	1:A:104:ARG:CG	2.03	0.67
1:B:192:TRP:CH2	1:B:199:LEU:HB3	2.29	0.67
1:B:226:GLN:H	1:B:243:VAL:HG22	1.60	0.67
1:A:343:LYS:CB	1:A:344:GLU:CA	2.73	0.67
1:A:344:GLU:N	1:A:344:GLU:OE1	2.28	0.66
1:A:45:ASN:ND2	1:A:277:GLN:OE1	2.29	0.66
1:A:344:GLU:CG	1:A:345:GLY:H	2.08	0.66
1:A:16:GLU:CD	1:A:16:GLU:C	2.55	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:195:THR:HG22	1:A:196:THR:HA	1.78	0.65
1:B:93:LEU:CD1	1:B:94:ALA:N	2.53	0.65
1:B:122:LYS:HA	1:B:124:GLU:H	1.61	0.65
1:A:244:ARG:HH11	1:A:244:ARG:HB3	1.62	0.65
1:B:113:ASN:O	1:B:116:ARG:HB2	1.97	0.65
1:B:183:ASP:HB2	1:B:201:THR:CB	2.23	0.65
1:B:223:TYR:CE2	1:B:226:GLN:HB3	2.32	0.65
1:A:32:VAL:HG13	1:A:340:VAL:O	1.96	0.65
1:B:261:MET:HE2	1:B:263:PHE:HE2	1.62	0.65
1:A:341:VAL:HG12	1:A:343:LYS:O	1.97	0.65
1:A:274:MET:CE	1:B:219:LEU:HD13	2.28	0.64
1:A:308:VAL:CB	1:A:309:ALA:HB3	2.17	0.64
1:A:184:LEU:O	1:A:199:LEU:O	2.16	0.64
1:B:122:LYS:CA	1:B:124:GLU:H	2.10	0.64
1:A:305:PHE:O	1:A:341:VAL:HG23	1.96	0.64
1:A:341:VAL:CG1	1:A:343:LYS:O	2.45	0.64
1:A:249:ILE:HD12	1:A:250:LEU:H	1.63	0.64
1:A:104:ARG:HG3	1:A:104:ARG:NH1	2.02	0.63
1:A:103:ALA:HB1	1:A:145:SER:CA	2.26	0.63
1:A:310:PRO:O	1:A:311:TRP:HB2	1.98	0.63
1:B:160:GLY:CA	1:B:171:LEU:HD21	2.28	0.63
1:A:46:LEU:N	1:A:278:ALA:O	2.28	0.62
1:B:222:VAL:HA	1:B:226:GLN:NE2	2.13	0.62
1:A:199:LEU:HD23	1:A:199:LEU:N	2.13	0.62
1:B:117:GLN:HG2	1:B:131:PHE:CD2	2.35	0.62
1:A:170:ILE:O	1:A:170:ILE:HD12	1.99	0.62
1:A:331:LYS:O	1:A:332:SER:HB3	1.99	0.62
1:A:344:GLU:HG2	1:A:345:GLY:N	2.10	0.62
1:B:79:VAL:HG23	1:B:80:LYS:CB	2.28	0.62
1:A:57:LEU:HD23	1:A:57:LEU:O	2.00	0.62
1:B:46:LEU:HD12	1:B:280:PHE:CE2	2.35	0.62
1:B:125:ILE:HG13	1:B:126:ALA:N	2.14	0.62
1:A:301:TYR:CA	1:A:302:THR:HG22	2.29	0.61
1:A:323:GLN:HB3	1:A:328:MET:CE	2.29	0.61
1:A:292:MET:HE2	1:A:328:MET:HG2	1.81	0.61
1:B:50:ILE:HD11	1:B:272:PRO:N	2.16	0.60
1:B:246:VAL:HG13	1:B:247:GLY:N	2.16	0.60
1:B:64:LEU:HD23	1:B:158:LYS:HE2	1.84	0.60
1:B:92:ASP:OD1	1:B:92:ASP:N	2.33	0.60
1:A:219:LEU:CD1	1:A:257:THR:HG21	2.31	0.60
1:A:278:ALA:CA	1:A:279:THR:OG1	2.48	0.60

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:302:THR:O	1:A:302:THR:HG23	2.02	0.60
1:B:120:LEU:O	1:B:122:LYS:N	2.34	0.60
1:B:103:ALA:HB1	1:B:145:SER:HA	1.84	0.60
1:B:128:LYS:HD2	1:B:128:LYS:O	2.03	0.59
1:B:214:ALA:CA	1:B:256:THR:HB	2.32	0.59
1:A:15:GLY:O	1:A:16:GLU:CB	2.51	0.59
1:B:57:LEU:HB2	1:B:203:ALA:HB2	1.84	0.59
1:A:300:PHE:H	1:A:300:PHE:HD2	1.49	0.59
1:A:181:VAL:HG22	1:A:200:MET:CE	2.32	0.59
1:B:66:GLY:HA2	1:B:192:TRP:O	2.02	0.59
1:A:288:ILE:HD12	1:A:289:VAL:H	1.67	0.59
1:A:74:GLN:HB2	1:A:77:ASP:OD2	2.03	0.59
1:A:120:LEU:O	1:A:126:ALA:HA	2.02	0.59
1:A:265:ASN:OD1	1:A:270:LEU:HB2	2.03	0.58
1:A:192:TRP:HE1	1:A:197:ALA:HB3	1.68	0.58
1:A:194:ASP:OD1	1:A:195:THR:N	2.36	0.58
1:A:217:LYS:HD2	1:A:321:GLY:HA3	1.84	0.58
1:A:32:VAL:HG11	1:A:339:ARG:HB3	1.85	0.58
1:A:269:ARG:HG3	1:A:269:ARG:HH11	1.68	0.58
1:A:40:VAL:HG23	1:A:285:HIS:CE1	2.39	0.57
1:A:297:GLN:HA	1:A:302:THR:N	2.19	0.57
1:A:17:ARG:NH1	1:A:312:GLN:OE1	2.34	0.57
1:B:79:VAL:CA	1:B:80:LYS:CB	2.82	0.57
1:A:264:ASP:OD2	1:A:266:PRO:HG3	2.05	0.57
1:B:117:GLN:CD	1:B:131:PHE:HA	2.23	0.57
1:A:347:LEU:HG	1:A:347:LEU:O	2.05	0.57
1:B:225:GLY:HA2	1:B:243:VAL:HG23	1.85	0.57
1:A:226:GLN:HA	1:A:227:SER:CB	2.23	0.57
1:B:75:LEU:HD12	1:B:76:GLY:N	2.20	0.57
1:A:40:VAL:CG2	1:A:285:HIS:NE2	2.67	0.56
1:A:192:TRP:CE2	1:A:199:LEU:HD22	2.38	0.56
1:B:265:ASN:O	1:B:266:PRO:C	2.42	0.56
1:A:195:THR:CA	1:A:196:THR:C	2.65	0.56
1:A:244:ARG:HH11	1:A:244:ARG:CB	2.18	0.56
1:A:271:ARG:HG3	1:A:274:MET:HE3	1.86	0.56
1:B:169:HIS:C	1:B:170:ILE:HD12	2.26	0.56
1:A:274:MET:HE1	1:B:219:LEU:HD13	1.88	0.56
1:A:251:ASP:O	1:A:253:ASP:N	2.38	0.56
1:B:265:ASN:HD22	1:B:270:LEU:HB2	1.70	0.55
1:A:130:ASP:HA	1:A:132:GLU:OE1	2.07	0.55
1:A:91:ALA:H	1:A:92:ASP:HB2	1.70	0.55

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:162:THR:O	1:B:171:LEU:HD12	2.05	0.55
1:B:48:ALA:HB1	1:B:210:VAL:HG12	1.89	0.55
1:B:259:VAL:HG12	1:B:259:VAL:O	2.06	0.55
1:B:124:GLU:HA	1:B:125:ILE:HG22	1.87	0.55
1:A:192:TRP:HE1	1:A:197:ALA:CB	2.20	0.55
1:A:300:PHE:HD2	1:A:300:PHE:N	2.04	0.55
1:A:245:TYR:HA	1:A:246:VAL:CB	2.35	0.54
1:A:123:SER:O	1:A:124:GLU:HB2	2.07	0.54
1:B:50:ILE:C	1:B:51:GLU:HG3	2.26	0.54
1:A:32:VAL:HG12	1:A:33:ALA:N	2.23	0.54
1:B:214:ALA:HB1	1:B:215:GLN:OE1	2.08	0.54
1:B:244:ARG:HH11	1:B:244:ARG:CB	2.20	0.54
1:A:195:THR:HG23	1:A:196:THR:O	2.08	0.54
1:B:236:ASP:O	1:B:237:ASP:OD1	2.26	0.54
1:A:69:VAL:HB	1:A:87:THR:OG1	2.06	0.54
1:A:192:TRP:CE2	1:A:199:LEU:CD2	2.91	0.54
1:A:295:ILE:HD12	1:A:296:VAL:N	2.23	0.54
1:A:343:LYS:H	1:A:344:GLU:HB3	1.73	0.54
1:B:267:ASP:OD1	1:B:267:ASP:C	2.47	0.54
1:A:223:TYR:CZ	1:A:226:GLN:HG2	2.43	0.53
1:B:57:LEU:HD13	1:B:57:LEU:O	2.06	0.53
1:A:217:LYS:CE	1:A:322:ALA:HA	2.31	0.53
1:A:269:ARG:HG3	1:A:269:ARG:NH1	2.22	0.53
1:B:64:LEU:HD23	1:B:158:LYS:CE	2.38	0.53
1:B:246:VAL:HG13	1:B:247:GLY:O	2.09	0.53
1:A:185:ASN:O	1:A:185:ASN:ND2	2.39	0.53
1:B:129:ARG:O	1:B:131:PHE:N	2.41	0.53
1:A:245:TYR:CD1	1:A:246:VAL:HB	2.44	0.53
1:B:93:LEU:HD11	1:B:169:HIS:O	2.08	0.53
1:B:122:LYS:N	1:B:123:SER:HB2	2.24	0.53
1:B:258:LYS:O	1:B:259:VAL:HG23	2.08	0.53
1:A:24:SER:OG	1:A:26:LEU:HD22	2.09	0.53
1:A:320:LEU:N	1:A:331:LYS:HG2	2.20	0.53
1:A:300:PHE:N	1:A:300:PHE:CD2	2.77	0.53
1:B:124:GLU:HA	1:B:125:ILE:CG2	2.39	0.52
1:A:61:LEU:HD23	1:A:198:SER:HB2	1.91	0.52
1:A:319:LYS:CA	1:A:320:LEU:CB	2.83	0.52
1:B:75:LEU:HD12	1:B:76:GLY:H	1.75	0.52
1:B:78:GLU:HG3	1:B:180:ARG:CZ	2.40	0.52
1:B:246:VAL:O	1:B:258:LYS:O	2.27	0.52
1:B:165:ALA:HA	1:B:166:GLY:C	2.30	0.52

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:26:LEU:HA	1:A:29:THR:OG1	2.10	0.52
1:B:214:ALA:HA	1:B:256:THR:HB	1.91	0.52
1:A:18:LEU:CD1	1:A:346:VAL:HG22	2.40	0.52
1:B:168:GLY:O	1:B:169:HIS:HB3	2.09	0.52
1:A:54:PRO:O	1:A:55:ALA:HB2	2.10	0.52
1:A:24:SER:OG	1:A:26:LEU:CD2	2.57	0.52
1:A:68:ILE:HG21	1:A:71:LEU:HD11	1.91	0.52
1:A:224:VAL:HG21	1:A:246:VAL:HG22	1.91	0.52
1:A:274:MET:HE2	1:B:219:LEU:HD13	1.91	0.51
1:B:215:GLN:O	1:B:216:GLU:C	2.49	0.51
1:A:128:LYS:HD2	1:A:129:ARG:H	1.75	0.51
1:B:112:ARG:NH1	1:B:116:ARG:HG2	2.24	0.51
1:B:224:VAL:HA	1:B:243:VAL:HG23	1.92	0.51
1:B:85:LEU:CD1	1:B:175:SER:HB2	2.33	0.51
1:B:131:PHE:O	1:B:133:GLN:N	2.43	0.51
1:A:261:MET:HG3	1:A:263:PHE:HE2	1.75	0.51
1:A:267:ASP:H	1:A:268:GLY:HA2	1.75	0.51
1:A:308:VAL:HB	1:A:309:ALA:CB	2.20	0.51
1:B:56:LYS:HD2	1:B:204:ASP:HB3	1.91	0.51
1:B:112:ARG:HH12	1:B:116:ARG:HG2	1.74	0.51
1:A:15:GLY:O	1:A:16:GLU:HB2	2.11	0.51
1:A:114:LEU:CD1	1:A:134:ALA:HB1	2.41	0.51
1:A:296:VAL:HG13	1:A:303:ARG:O	2.11	0.50
1:A:316:ARG:CG	1:A:316:ARG:NH1	2.57	0.50
1:A:333:GLY:HA2	1:A:334:LEU:O	2.11	0.50
1:A:107:MET:HG3	1:A:142:ALA:HA	1.92	0.50
1:A:235:TYR:CZ	1:A:269:ARG:HB2	2.47	0.50
1:A:295:ILE:HD12	1:A:296:VAL:H	1.76	0.50
1:B:135:GLN:OE1	1:B:135:GLN:O	2.29	0.50
1:B:264:ASP:HB3	1:B:266:PRO:HD2	1.93	0.50
1:A:70:SER:C	1:A:71:LEU:HD12	2.32	0.50
1:A:26:LEU:CD2	1:A:26:LEU:H	2.25	0.49
1:B:275:PHE:CG	1:B:276:ALA:N	2.80	0.49
1:B:213:ASN:O	1:B:214:ALA:CB	2.58	0.49
1:A:296:VAL:O	1:A:302:THR:HA	2.13	0.49
1:A:302:THR:CG2	1:A:302:THR:O	2.60	0.49
1:A:104:ARG:NH1	1:A:149:ASP:OD1	2.45	0.49
1:A:164:GLN:OE1	1:A:165:ALA:N	2.44	0.49
1:A:235:TYR:CE2	1:A:269:ARG:HB2	2.47	0.49
1:B:79:VAL:O	1:B:179:GLY:O	2.31	0.49
1:A:307:GLU:OE1	1:A:310:PRO:HA	2.13	0.49

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:63:PRO:O	1:B:64:LEU:CB	2.60	0.49
1:B:243:VAL:HG23	1:B:243:VAL:O	2.12	0.49
1:A:26:LEU:CD2	1:A:26:LEU:N	2.76	0.49
1:B:131:PHE:C	1:B:133:GLN:H	2.16	0.49
1:A:57:LEU:HD23	1:A:57:LEU:C	2.33	0.48
1:A:81:ALA:HA	1:A:82:GLY:HA2	1.52	0.48
1:B:90:SER:HB3	1:B:93:LEU:CG	2.42	0.48
1:B:157:ALA:C	1:B:159:GLY:H	2.15	0.48
1:B:215:GLN:O	1:B:218:ASP:N	2.42	0.48
1:A:199:LEU:N	1:A:199:LEU:CD2	2.76	0.48
1:A:24:SER:OG	1:A:25:PRO:HD2	2.12	0.48
1:A:50:ILE:HG22	1:A:272:PRO:HA	1.96	0.48
1:A:100:ALA:HB1	1:A:104:ARG:NH1	2.29	0.48
1:A:271:ARG:HH11	1:A:274:MET:CE	2.26	0.48
1:B:116:ARG:O	1:B:119:GLU:HB3	2.14	0.48
1:A:30:LEU:HD23	1:A:30:LEU:HA	1.64	0.48
1:A:224:VAL:HA	1:A:243:VAL:HG23	1.96	0.48
1:B:90:SER:HB3	1:B:93:LEU:CD2	2.43	0.48
1:A:16:GLU:OE1	1:A:17:ARG:N	2.46	0.48
1:A:93:LEU:HD23	1:A:169:HIS:HB3	1.95	0.48
1:A:309:ALA:HB1	1:A:312:GLN:CD	2.33	0.48
1:B:90:SER:CB	1:B:93:LEU:HG	2.41	0.48
1:B:163:LEU:H	1:B:163:LEU:HG	1.34	0.48
1:A:26:LEU:HD22	1:A:26:LEU:H	1.78	0.48
1:B:131:PHE:C	1:B:133:GLN:N	2.64	0.48
1:A:24:SER:OG	1:A:25:PRO:CD	2.62	0.48
1:A:347:LEU:O	1:A:347:LEU:CG	2.61	0.48
1:B:78:GLU:HG3	1:B:180:ARG:NH1	2.29	0.47
1:B:90:SER:O	1:B:93:LEU:CD1	2.62	0.47
1:A:112:ARG:O	1:A:116:ARG:HG2	2.14	0.47
1:A:194:ASP:CB	1:A:197:ALA:HB2	2.31	0.47
1:B:261:MET:HE2	1:B:263:PHE:CE2	2.47	0.47
1:A:129:ARG:O	1:A:131:PHE:N	2.47	0.47
1:A:192:TRP:NE1	1:A:197:ALA:CB	2.77	0.47
1:B:63:PRO:O	1:B:64:LEU:HB2	2.15	0.47
1:B:258:LYS:HG3	3:B:369:HOH:O	2.13	0.47
1:B:87:THR:HA	1:B:171:LEU:O	2.15	0.47
1:B:50:ILE:HD11	1:B:271:ARG:C	2.36	0.47
1:B:214:ALA:H	1:B:256:THR:HB	1.79	0.47
1:A:129:ARG:HD2	1:A:132:GLU:OE2	2.16	0.46
1:A:300:PHE:C	1:A:301:TYR:CG	2.88	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:341:VAL:HG11	1:A:343:LYS:O	2.15	0.46
1:A:62:PRO:HG3	1:A:192:TRP:CD1	2.50	0.46
1:A:20:VAL:O	1:A:27:ARG:NH1	2.49	0.46
1:B:246:VAL:CG1	1:B:247:GLY:N	2.77	0.46
1:A:196:THR:O	1:A:197:ALA:HB3	2.16	0.46
1:B:86:PHE:CZ	1:B:173:VAL:HG11	2.51	0.46
1:B:184:LEU:O	1:B:185:ASN:OD1	2.34	0.46
1:A:192:TRP:NE1	1:A:197:ALA:HB1	2.31	0.46
1:B:214:ALA:HB1	1:B:215:GLN:CA	2.46	0.46
1:A:302:THR:HG23	1:A:318:ILE:O	2.16	0.46
1:A:102:LYS:O	1:A:103:ALA:C	2.55	0.45
1:B:223:TYR:H	1:B:226:GLN:HE21	1.64	0.45
1:A:104:ARG:CZ	1:A:149:ASP:OD1	2.64	0.45
1:B:50:ILE:CD1	1:B:272:PRO:HA	2.47	0.45
1:A:251:ASP:O	1:A:251:ASP:OD1	2.35	0.45
1:B:76:GLY:O	1:B:180:ARG:NH1	2.46	0.45
1:A:219:LEU:HD11	1:A:257:THR:HG21	1.97	0.45
1:B:223:TYR:H	1:B:226:GLN:NE2	2.15	0.45
1:B:50:ILE:HD11	1:B:272:PRO:CA	2.46	0.45
1:B:124:GLU:CG	1:B:125:ILE:HG23	2.41	0.45
1:A:50:ILE:HD12	1:A:274:MET:HB2	1.99	0.45
1:A:129:ARG:HG3	1:A:132:GLU:CD	2.38	0.44
1:A:295:ILE:HD13	1:A:318:ILE:HD11	1.98	0.44
1:B:60:VAL:HG21	1:B:86:PHE:HE1	1.83	0.44
1:B:62:PRO:HD3	1:B:199:LEU:CD2	2.47	0.44
1:B:265:ASN:O	1:B:267:ASP:N	2.51	0.44
1:A:104:ARG:CG	1:A:104:ARG:NH1	2.69	0.44
1:B:90:SER:O	1:B:93:LEU:HD11	2.17	0.44
1:A:45:ASN:HA	1:A:279:THR:H	1.82	0.44
1:B:226:GLN:N	1:B:243:VAL:HG22	2.31	0.44
1:A:114:LEU:HD13	1:A:134:ALA:HB1	2.00	0.44
1:A:71:LEU:HD12	1:A:71:LEU:N	2.33	0.43
1:A:181:VAL:HG22	1:A:200:MET:HE1	2.00	0.43
1:B:125:ILE:CG1	1:B:126:ALA:N	2.78	0.43
1:B:91:ALA:O	1:B:95:GLN:HB2	2.18	0.43
1:A:290:VAL:HG22	1:A:330:VAL:HG23	1.99	0.43
1:A:292:MET:HE2	1:A:328:MET:HB2	1.98	0.43
1:B:57:LEU:CB	1:B:203:ALA:HB2	2.48	0.43
1:A:184:LEU:O	1:A:185:ASN:CG	2.56	0.43
1:A:192:TRP:CE2	1:A:197:ALA:HB1	2.54	0.43
1:A:217:LYS:HZ1	1:A:323:GLN:CG	2.31	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:112:ARG:HD2	1:B:112:ARG:HA	1.52	0.43
1:A:61:LEU:HD22	1:A:196:THR:CA	2.49	0.43
1:A:86:PHE:CE2	1:A:173:VAL:HG21	2.54	0.43
1:A:331:LYS:O	1:A:332:SER:CB	2.66	0.43
1:B:122:LYS:HA	1:B:123:SER:C	2.38	0.43
1:B:186:ALA:CB	1:B:199:LEU:HB2	2.48	0.43
1:B:199:LEU:N	1:B:199:LEU:CD2	2.79	0.43
1:B:234:ALA:O	1:B:235:TYR:CB	2.59	0.43
1:B:251:ASP:O	1:B:253:ASP:N	2.52	0.43
1:A:30:LEU:HD22	1:A:343:LYS:O	2.19	0.43
1:B:60:VAL:CG2	1:B:86:PHE:HE1	2.31	0.43
1:A:323:GLN:O	1:A:324:ILE:CG1	2.46	0.43
1:B:102:LYS:O	1:B:103:ALA:C	2.55	0.43
1:B:120:LEU:O	1:B:121:ASP:C	2.57	0.43
1:A:164:GLN:OE1	1:A:164:GLN:HA	2.18	0.42
1:A:224:VAL:HA	1:A:243:VAL:CG2	2.49	0.42
1:B:254:THR:O	1:B:255:ARG:HB2	2.19	0.42
1:A:272:PRO:HD2	1:B:248:GLN:O	2.19	0.42
1:B:225:GLY:HA2	1:B:243:VAL:CG2	2.48	0.42
1:A:249:ILE:HD12	1:A:250:LEU:N	2.32	0.42
1:A:233:ASP:HA	1:A:234:ALA:HA	1.66	0.42
1:A:293:SER:OG	1:A:342:VAL:HG12	2.20	0.42
1:A:226:GLN:CB	1:A:227:SER:HB2	2.49	0.42
1:B:233:ASP:HA	1:B:234:ALA:HA	1.45	0.42
1:A:35:ALA:HB1	1:A:288:ILE:HD13	2.01	0.42
1:A:209:PHE:CE1	1:A:262:VAL:HG22	2.55	0.42
1:B:42:ALA:HA	1:B:43:PRO:HD2	1.87	0.42
1:B:83:ASP:O	1:B:174:ARG:O	2.37	0.42
1:B:165:ALA:HA	1:B:167:GLY:N	2.35	0.42
1:A:109:MET:HE2	1:B:140:GLN:HA	2.02	0.42
1:A:267:ASP:N	1:A:268:GLY:HA2	2.33	0.42
1:B:72:ASN:OD1	1:B:72:ASN:N	2.52	0.42
1:B:271:ARG:HA	1:B:272:PRO:HD3	1.91	0.42
1:A:94:ALA:O	1:A:95:GLN:C	2.57	0.41
1:A:324:ILE:HA	1:A:325:GLY:HA2	1.57	0.41
1:B:89:ASP:OD1	1:B:169:HIS:HE1	2.03	0.41
1:A:117:GLN:OE1	1:A:134:ALA:HB2	2.21	0.41
1:B:50:ILE:HD11	1:B:272:PRO:HA	2.01	0.41
1:B:54:PRO:HA	1:B:55:ALA:HA	1.58	0.41
1:A:296:VAL:CG2	1:A:297:GLN:N	2.83	0.41
1:B:126:ALA:HA	1:B:127:ALA:HA	1.57	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:243:VAL:CG2	1:A:243:VAL:O	2.68	0.41
1:A:320:LEU:HD12	1:A:320:LEU:HA	1.86	0.41
1:B:63:PRO:O	1:B:64:LEU:HG	2.21	0.41
1:B:223:TYR:O	1:B:243:VAL:CG2	2.69	0.41
1:B:237:ASP:HA	1:B:238:PRO:HD3	1.67	0.41
1:A:124:GLU:O	1:A:125:ILE:HG13	2.21	0.41
1:A:100:ALA:O	1:A:104:ARG:NH1	2.54	0.41
1:A:114:LEU:HD13	1:A:134:ALA:C	2.41	0.41
1:A:195:THR:CG2	1:A:196:THR:HA	2.48	0.41
1:A:271:ARG:HB2	1:A:274:MET:HE2	2.02	0.41
1:B:236:ASP:O	1:B:237:ASP:CG	2.59	0.41
1:A:10:ALA:HA	1:A:11:LEU:CB	2.51	0.41
1:A:334:LEU:HA	1:A:334:LEU:HD12	1.87	0.41
1:B:50:ILE:C	1:B:50:ILE:HD12	2.41	0.41
1:B:50:ILE:CG1	1:B:271:ARG:O	2.69	0.41
1:B:62:PRO:O	1:B:195:THR:HG22	2.21	0.41
1:B:163:LEU:O	1:B:164:GLN:HB2	2.20	0.41
1:B:254:THR:HB	1:B:256:THR:HG23	2.03	0.41
1:B:270:LEU:CD1	1:B:270:LEU:N	2.84	0.41
1:A:114:LEU:HD21	1:A:135:GLN:OE1	2.21	0.41
1:A:244:ARG:HH11	1:A:244:ARG:CG	2.32	0.41
1:B:63:PRO:O	1:B:63:PRO:HG2	2.21	0.41
1:A:243:VAL:HA	1:A:261:MET:HB3	2.03	0.40
1:A:114:LEU:HD12	1:A:134:ALA:HB1	2.03	0.40
1:A:122:LYS:O	1:A:123:SER:C	2.59	0.40
1:A:163:LEU:HG	1:A:164:GLN:N	2.36	0.40
1:B:50:ILE:HG12	1:B:271:ARG:O	2.21	0.40
1:B:66:GLY:HA3	1:B:191:TYR:HE1	1.86	0.40
1:B:93:LEU:HG	1:B:93:LEU:H	1.74	0.40
1:B:121:ASP:O	1:B:121:ASP:CG	2.58	0.40
1:A:38:GLU:OE1	1:A:327:ARG:NH2	2.50	0.40
1:A:98:SER:O	1:A:101:ALA:HB3	2.22	0.40
1:A:344:GLU:CG	1:A:345:GLY:N	2.77	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	A	339/359 (94%)	266 (78%)	39 (12%)	34 (10%)	0	1
1	B	243/359 (68%)	192 (79%)	25 (10%)	26 (11%)	0	1
All	All	582/718 (81%)	458 (79%)	64 (11%)	60 (10%)	0	1

All (60) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	16	GLU
1	A	23	GLU
1	A	56	LYS
1	A	122	LYS
1	A	123	SER
1	A	227	SER
1	A	233	ASP
1	A	246	VAL
1	A	320	LEU
1	A	332	SER
1	B	56	LYS
1	B	80	LYS
1	B	81	ALA
1	B	121	ASP
1	B	122	LYS
1	B	130	ASP
1	B	235	TYR
1	B	236	ASP
1	B	259	VAL
1	B	265	ASN
1	B	266	PRO
1	A	94	ALA
1	A	95	GLN
1	A	130	ASP
1	A	279	THR

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Mol	Chain	Res	Type
1	A	302	THR
1	B	73	LYS
1	B	119	GLU
1	B	125	ILE
1	A	73	LYS
1	A	96	ALA
1	A	197	ALA
1	A	252	ALA
1	A	301	TYR
1	A	309	ALA
1	A	334	LEU
1	B	64	LEU
1	B	66	GLY
1	B	124	GLU
1	B	160	GLY
1	B	237	ASP
1	B	252	ALA
1	B	267	ASP
1	A	92	ASP
1	A	124	GLU
1	A	232	PHE
1	A	300	PHE
1	A	324	ILE
1	B	161	GLY
1	B	164	GLN
1	B	175	SER
1	A	11	LEU
1	A	55	ALA
1	A	117	GLN
1	B	54	PRO
1	B	214	ALA
1	A	54	PRO
1	A	346	VAL
1	A	168	GLY
1	A	321	GLY

5.3.2 Protein sidechains

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was

analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	256/283 (90%)	212 (83%)	44 (17%)	2	6
1	B	180/283 (64%)	147 (82%)	33 (18%)	1	5
All	All	436/566 (77%)	359 (82%)	77 (18%)	2	5

All (77) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	16	GLU
1	A	26	LEU
1	A	39	THR
1	A	57	LEU
1	A	58	VAL
1	A	72	ASN
1	A	73	LYS
1	A	95	GLN
1	A	97	ASN
1	A	98	SER
1	A	102	LYS
1	A	104	ARG
1	A	119	GLU
1	A	120	LEU
1	A	133	GLN
1	A	140	GLN
1	A	151	ARG
1	A	169	HIS
1	A	184	LEU
1	A	193	ASN
1	A	199	LEU
1	A	222	VAL
1	A	227	SER
1	A	243	VAL
1	A	244	ARG
1	A	246	VAL
1	A	249	ILE
1	A	260	ARG
1	A	269	ARG
1	A	270	LEU
1	A	279	THR
1	A	288	ILE
1	A	295	ILE
1	A	296	VAL

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Mol	Chain	Res	Type
1	A	300	PHE
1	A	301	TYR
1	A	302	THR
1	A	303	ARG
1	A	316	ARG
1	A	318	ILE
1	A	319	LYS
1	A	328	MET
1	A	342	VAL
1	A	348	LEU
1	B	50	ILE
1	B	51	GLU
1	B	57	LEU
1	B	60	VAL
1	B	71	LEU
1	B	72	ASN
1	B	75	LEU
1	B	79	VAL
1	B	92	ASP
1	B	95	GLN
1	B	112	ARG
1	B	120	LEU
1	B	128	LYS
1	B	132	GLU
1	B	133	GLN
1	B	135	GLN
1	B	155	LEU
1	B	162	THR
1	B	163	LEU
1	B	178	ASN
1	B	183	ASP
1	B	184	LEU
1	B	188	THR
1	B	217	LYS
1	B	224	VAL
1	B	231	LYS
1	B	232	PHE
1	B	244	ARG
1	B	260	ARG
1	B	261	MET
1	B	267	ASP
1	B	281	LEU

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Mol	Chain	Res	Type
1	B	282	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	B	146	GLN
1	B	221	HIS
1	B	226	GLN
1	B	265	ASN

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

Of 1 ligands modelled in this entry, 1 is monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

5.7 Other polymers [i](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	341/359 (94%)	0.24	11 (3%) 47 37	53, 79, 139, 218	0
1	B	245/359 (68%)	0.32	14 (5%) 23 15	59, 86, 144, 268	0
All	All	586/718 (81%)	0.27	25 (4%) 35 25	53, 83, 144, 268	0

All (25) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	125	ILE	12.4
1	B	167	GLY	9.2
1	A	127	ALA	8.2
1	B	166	GLY	6.4
1	A	125	ILE	6.0
1	B	124	GLU	5.8
1	B	123	SER	5.5
1	A	123	SER	5.1
1	A	124	GLU	4.6
1	B	165	ALA	4.5
1	A	167	GLY	3.6
1	B	40	VAL	3.4
1	B	163	LEU	2.7
1	B	126	ALA	2.6
1	B	41	ALA	2.5
1	B	235	TYR	2.4
1	A	128	LYS	2.3
1	A	71	LEU	2.3
1	A	13	HIS	2.3
1	A	171	LEU	2.3
1	B	129	ARG	2.2
1	A	168	GLY	2.1
1	B	168	GLY	2.1
1	A	170	ILE	2.1

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Mol	Chain	Res	Type	RSRZ
1	B	281	LEU	2.0

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	ZN	A	360	1/1	0.99	0.17	77,77,77,77	0

6.5 Other polymers [i](#)

There are no such residues in this entry.